

**Upper Animas Mining District
EPR Management Briefing
April 8, 2010**

Background

- Mining district within San Juan County -13 major volcanic calderas – highly mineralized and extensively mined from 1874 to 1991. Three drainages: Mineral Creek, the Upper Animas, and Cement Creek, all of which flow to the Animas River.
- Many mine sources due to 1500 mine sites within 186 sq miles. The area had four railroads, three smelters, and over thirty mills.
- San Juan County - the smallest and one of the most economically challenged in Colorado; 150+ jobs lost in 1991
- Approximately 85% of the land in the Upper Animas Basin is under public ownership. A large number of abandoned orphan mine sites are located on U.S. Forest Service (FS) or U.S Bureau of Land Management (BLM) property; however, there are many private patented claims interspersed throughout the basin.
- In 1997, the Department of Interior began an Abandoned Mined Lands Initiative (AML) to study two pilot areas; to better understand how to handle problems these sites may create. One BLM AML focus area is the Upper Animas Basin. BLM/USFS have had a significant role in the non-time critical removal actions over the years.
- The Animas River begins high in the San Juan Mountains, above Silverton, in southwest Colorado. The river flows south through Durango for almost eighty miles to the New Mexico border. It continues nearly thirty more miles, meeting the San Juan River in Farmington, New Mexico.
- Standard Metals Corp. (SMC), then Sunnyside Mining Corp. had several water quality-related and mine waste discharges, tailings releases, notices of violation, and eventually a Consent Decree with CDPHE WCQD. Sunnyside and WCQD agreed to pollution trading to deal with water quality issues.
- There have been remediation efforts in Mineral Creek, the Upper Animas, and Cement Creek, but Cement Creek is still having a negative impact on the TMDL compliance point, known as A72.
- In the Cement Creek drainage, active water treatment began by SMC in 1970s and was updated over the years by Sunnyside. Since 1996, the American Tunnel has had three bulkheads installed, flow has decreased from 1,600 gpm to about 150 gpm. The Red & Bonita Mine, and other upgradient adits' and seeps discharges are now making up the difference in the American Tunnel flow. Gladstone's active water treatment stopped in 2005; settling ponds reclaimed in 2006.

Regulatory Involvement and Stakeholder Group Formation

- Eighteen months of negotiations between federal, state and private interests after EPA thought about watershed-wide NPL designation in the mid-1990s. Silverton

citizenry and their relatives who were employed by the mining companies have always been against NPL listing or other regulatory involvement in the watershed.

- 1994 - the ARSG formed due to the mining district's numerous source areas, historic mine discharges and tailings releases, and more recent documented CWA and NPDES violations, which made the area ripe for regulation and enforcement actions.
- Formation was also in response to the Colorado Water Control Division's (WQCD) reevaluation and upgrading of water quality standards for the Upper Animas River Basin.
- The ARSG has developed a watershed plan, and Use Attainability Analysis (UAA), dated January 2001. The drainages have had TMDLs developed.
- The ARSG studied 1,500 mines, focused on 173 draining mine adits and 157 mine waste sites, then identified about 33 adits and 32 waste sites to prioritize. These were judged to be the highest ranking contributors of metals in the Animas River. The ARSG prioritized their actions based on:
 - 1. Technology needed for remediation,
 - 2. Funds, and
 - 3. Property access.

EPA Involvement

- 1994 – 2004 Carol Russell represented EPR-EP in the ARSG.
- In 1996, the Regional Administrator agreed to forego listing as long as the ARSG made progress in mine site remediation and water quality improvements. Since 1994, EPA has regularly attended the monthly Animas River Stakeholders Group meetings, had regular talks with the County Administrator, Town/County Planner, and community members. This has helped EPA (Carol Russell before me) find out how best to support the community.
- 2003 – 2004 – EPA's Max Dodson, Ron Cattany of DRMS (formerly CDMG) and Howard Roitman (CDPHE) created a Memorandum of Understanding for the San Juan Mountains Focus Area, a regional initiative to better coordinate federal and state programs where CWA, CERCLA, SDWA, and RCRA were involved.
- Internally, EPR management wanted One Face in a Watershed to support Land & Water Remediation, Reuse, Revitalization, and Restoration (LR⁴).
- 2005 – Present – In support of LR⁴, I have been involved as EPR Site Assessment Manager, watershed representative, and Brownfields Project Manager.

Objectives:

- Keep a relationship with the Silverton, San Juan County, and ARSG going.
 - Identify areas that still need work and where CERCLA may be the appropriate tool.
 - Assist ARSG with water quality data collection in a significantly impacted portion of the watershed.
- Presently, EPA's regional team consists of Site Assessment and Brownfields (Sabrina Forrest), with backup and technical support as needed; primarily from Steve Way and Richard Sisk. I attend the monthly

Relationship of removals - do something sooner rather than later; inventory in watershed

stakeholder meetings and stays in touch with locals about ongoing and new projects.

- EPA was involved in the successful Cleanup at the Rose Walsh Smelter - EPA provided Targeted Brownfields Assessment support followed by successful Cleanup Grant for affordable housing project.
- EPA Site Assessment developed a Sampling and Analysis Plan for water quality sampling because I had the technical ability and wanted to be able to weigh in on how to characterize the environmental issues for EPA and the ARSG. We are:
 - Collecting monthly water samples and flow measurements; and
 - Assessing changes in water quality and metals loads over time, since flows and loads have not been consistently evaluated, esp. since bulkheads were installed and the WTP was removed.

Questions that EPA and the stakeholders want to answer are:

PSQ1 - What are the seasonal and annual variability in water chemistry, metals loads, and discharges from the upper Cement Creek sources of mine-impacted water sources?

PSQ2 - Can the Cement Creek water quality data be used to quantify impacts to the Animas River?

PSQ3 - Are there additional seeps and springs emanating and impacting loads in Cement Creek and the Animas River;

PSQ4 - Can it be determined if, and when equilibrium has been reached in this portion of the watershed?

PSQ5 - Can these data support stakeholder input and decisions on the future design and cost estimates for a water treatment system?

PSQ6 - Can these data support stakeholder input and decisions on a possible micro hydroelectric power plant to be used to power a water treatment system?

①

ERR

EPM charging if data are at long used to support

removal @ listing

↓

loads will help then !!

↓

split charges with

WR ↓ Strategy ...

need to figure out something more

What makes sense where?

Don't do standard, new Demo project listing in a creative manner

Stakeholder Process History

Those involved include:

- Animas River Stakeholder Group (ARSG)
- Bureau of Land Management (BLM)
- Colorado Department of Public Health and Environment, Hazardous Materials & Waste Management Division (HMWMD)
- Colorado Department of Public Health and Environment, Water Quality Control Division (WQCD)
- Colorado Division of Reclamation, Mining & Safety (DNR DRMS)
- Colorado Goldfields Inc.
- Gold King Mines Corp. (GKM)
- Salem Minerals Inc. (SMI)
- San Juan Corp. (SJC)
- San Juan County
- Silver Wing Company Inc. (SWC)
- Southwest Water Conservation District (SWCD)
- Sunnyside Gold Company (SGS)
- Trout Unlimited (TU)
- USDA Forest Service (USFS)
- U.S. Environmental Protection Agency (EPA)
- U.S. Geological Survey (USGS)

Stakeholder Successes

- ARSG-lead cleanups in the Animas and Mineral Creek have improved water quality and habitat near Silverton and downstream to the New Mexico state line. Salmon flies have been migrating upstream on the Animas River from New Mexico to the 32nd Str Bridge in Durango.
- 1) The Animas River Stakeholders Group in the San Juan Mountains of Colorado coordinated and conducted extensive water-quality and benthic macroinvertebrate sampling showing improvements to the aquatic ecosystem after remediation
- Last fall CDOW did a fish survey in Maggie, Minnie, and Cunningham Gulches which haven't been surveyed since the 80's. CDOW found a significant increase in population density and size classes. Also productivity was in the 50 to 95 lbs./acre in the three streams.
- Ongoing support for ARSG by local community and local governments, Southwest Water Conservation District, and the maintenance of good monthly meeting participation.
- Development of a Good Sam web site and legislative efforts including lobbying in DC via ARSG and WQCC member Peter Butler and the SWCD.

- Commitment by ARSG and the BLM to a new water treatment plant constructed at Gladstone. This may be in the form of a demonstration facility.
- ARSG and DRMS are planning for two more significant cleanups in the Mineral Creek drainage this year: Silver Ledge and Koehler
- - Examples and some dollar amounts of mine waste cleanups by:
 - BLM/USFS,
 - ARSG using NPS 319 grant \$\$ (DRMS support)
 - Mining Cos.

Challenges/Ongoing Issues

- From ARSG perspective, they recognize there are ongoing water quality issues in Upper Cement Creek, but inability to address due to lack of Good Sam provisions that will protect from 3rd party CWA suits.
- Lack of water treatment in Gladstone is impacting the TMDL compliance point below Silverton at A72.
- Water quality flow and loads have been changing since the last bulkhead went into the American Tunnel (2002).
- The worst sources are the Gold King Mine 7 level; Red & Bonita Mine, American Tunnel, and the Mogul Mine (Grand Mogul to lesser degree).
- From EPA perspective, the remaining areas that need addressed may be NPL-caliber, but we don't have community support at this time.
 - Data Gap Analysis for Targeted Listing Viability indicates there are 28 unremediated sources within the Cement Creek drainage totaling about 146,000 cubic yards of mine-related waste, some near or in surface water. Metals of Concern: As, Cu, Cd, Pb, Mn, Zn.
 - Sources and sediments would need resampled for and HRS package; however, I don't plan to do that until we know where targeted listing would best be done.
 - Some areas may be ripe for Removal Program efforts in 2010? – 2013;
 - Funds could come from SMC special account funds – BLM has same settlement amounts (about \$130,000 at this time) and BLM and EPA have discussed prioritizing the same sites to get the biggest bang for the buck - there are several good candidates in Upper Cement Creek with private ownership.
 - Mogul, Grand Mogul, Gold King 7 level – primarily one private owner with re-mining interest with whom Steve Way and Richard Sisk have experience.
 - Red & Bonita – owners have been identified, but as yet unresponsive.

- Planned PA/SI – KittiMac Tailings (privately owned) in the Animas Drainage 5-6 miles upstream of Silverton
- Possible SI or removal action: Kendrick & Gelder Smelter – also in/near Cement Creek, but close to town at mouth of creek
- Lackawanna Mill TBA may need Brownfields oversight or liaison work with CDPHE
- \$4 Million from ASARCO Silver Lake settlement in Trust; State lead, but the CDPHE and ARSG are working to identify where those funds could be used, e.g., active water treatment plant somewhere.
- NPL??? – EPA gave ARSG a Targeted NPL presentation in about 2008, but ARSG still unreceptive to NPL.
- Ongoing R8 support to keep our relationship with ARSG members strong
 - Attend ARSG meetings
 - Share data
 - Be clear with ARSG and County regarding our objectives, ability to support (where and why), and our limitations.
 - Stay involved so that CERCLA can continue to be involved. It may take time for community to see the benefit of Superfund.

		High Flow (May, June, July)						Pounds/Day (total)						Low Flow (Aug, Sept, Nov)						Ave. pH
		Al	Cd	Cu	Fe	Mn	Zn	Al	Cd	Cu	Fe	Mn	Zn							
Grand Mogul	cc01c	1.17	0.01	0.274	1.52	1.13	2.23	0.312	0.003	0.1	1.86	0.218	0.834	3.2						
Mogul	cc02d	3.15	0.05	0.04	32.2	27.2	29.1	2.01	0.034	0.017	20.7	19.1	21.1	3.5						
Red & Bonita	cc03d	13.3	0.13	0.081	318	118	56.6	13.5	0.136	0.021	356	129	61.9	6.21						
Gold King	cc06	98.7	0.186	17.6	360	73.9	71.4	60.1	0.161	10.3	224	86.2	60.3	3.15						
Amer. Tunnel	cc19	8.6	0.004	0.011	215	74.8	29.1	6.98	0.003	0.0083	192	66	26.4	5.09						
Total:		124.92	0.38	18.006	926.72	295.03	188.43	82.902	0.337	10.446	794.56	300.52	170.53							
BLH % of total that is Grand Mogul + Amer Tunnel		7.8	3.7	1.6	23.4	25.7	16.6	8.8	1.8	1.0	24.4	22.0	16.0							
UAA results total of adits (Animas, Mineral and Cement) for comparison		138	1.29	44.5	1110	822	271	83	0.45	31	712	109	124							
North Fork	cc07	151.5	0.344	24.5	402	102	102.6	87.8	0.216	16.7	211	97	70	3.19						

Notes: No flow at R & B in Nov, but there are concentrations.
No flow at Grand Mogul in Aug & Nov, but there are concentrations.

Peter Butler (2/16/10) colored lines added by Kay Zillich

*Five largest discharges
in Cement Creek*

		Pounds/Day (total)															Ave. pH
		High Flow							Low Flow								
		Al	Cd	Cu	Fe	Mn	Zn	Pb	Al	Cd	Cu	Fe	Mn	Zn	Pb		
Five largest discharges in Cement Creek	Grand Mogul	cc01c	1.17	0.01	0.274	1.52	1.13	2.23	0.018	0.312	0.003	0.1	1.86	0.218	0.834	0.001	3.2
	Mogul	cc02d	3.15	0.05	0.04	32.2	27.2	29.1	0.157	2.01	0.034	0.017	20.7	19.1	21.1	0.135	3.5
	Red & Bonita	cc03d	13.3	0.13	0.081	318	118	56.6	0.189	13.5	0.136	0.021	356	129	61.9	0.146	6.21
	Gold King level	cc06	98.7	0.186	17.6	360	73.9	71.4	0.052	60.1	0.161	10.3	224	86.2	60.3	0.049	3.15
	Amer. Tunnel	cc19	8.6	0.004	0.011	215	74.8	29.1	0.006	6.98	0.003	0.0083	192	66	26.4	0.004	5.09
	Total:		124.92	0.38	18.006	926.72	295.03	188.43	0.422	82.902	0.337	10.446	794.56	300.52	170.53	0.335	
	North Fork	cc07 ← upstr of CC # downstr of GK7	151.5	0.344	24.5	402	102	102.6	0.177	87.8	0.216	16.7	211	97	70	0.463	3.19
All 34 prioritized in 2001 adits from Table 11.1 of UAA			198	1.3	44.5	1272	825	271		143	0.46	31.0	875	113	124		

Notes: No flow at R & B in Nov, but there are concentrations.
No flow at Grand Mogul in Aug & Nov, but there are concentrations.

UAA indicates 85% of loads are from adits/discharges and 15% are from mine waste rock sites.

Table 11.1 Metal loads from selected adits in the Upper Animas Basin

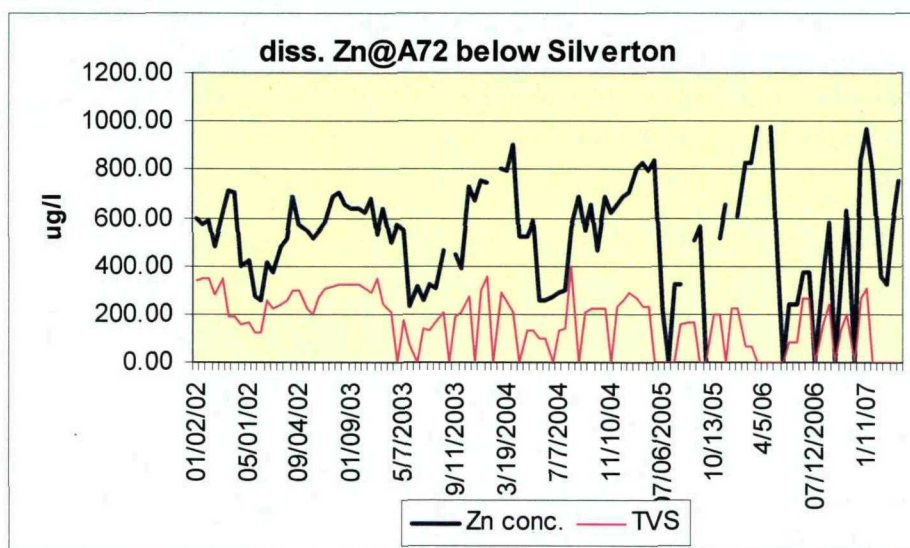
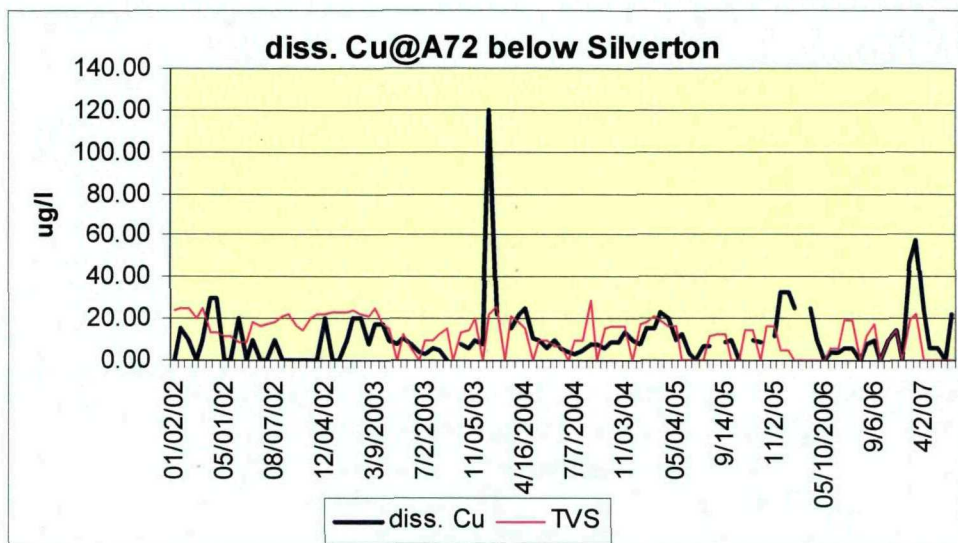
Pounds per day														
			High Flow						Low Flow					
Mine	Phase 1 % Removal	Cost \$ 1000's	Al	Cd	Cu	Fe	Mn	Zn	Al	Cd	Cu	Fe	Mn	Zn
<u>Cement Creek</u>														
Mogul	80%	1,000	1	0.04	1.7	14	4	2	1	0.02	0.7	5	1	3
Silver Ledge	50%	300	25	0.09	0.6	222	33	15	4	0.03	0.0	56	11	3
Grand Mogul	0%	60	15	0.15	5.3	33	10	27	1	0.01	0.2	0	0	1
Mammoth	30%	60	1	0.00	0.0	14	2	8	1	0.00	0.0	16	2	0
Anglo-Saxon	30%	60	0	0.00	0.0	15	10	2	0	0.01	0.0	15	5	1
Joe & Johns	30%	300	0	0.00	0.2	1	1	1	0	0.00	0.0	1	0	0
Big Colorado	50%	300	1	0.00	0.0	3	3	0	1	0.00	0.0	6	0	0
Porcupine	30%	60	0	0.00	0.0	14	5	1	0	0.00	0.0	10	5	1
Evelyn	50%	1,000	1	0.00	0.0	2	0	0	2	0.00	0.0	3	0	0
Lewis property*	50%	60	0	0.01	0.4	2	0	1	0	0.01	0.4	2	0	1
Total Cement Creek			44	0.29	8.3	320	68	57	10	0.07	1.3	113	25	12
<u>Mineral Creek</u>														
Kohler	50%	60	33	0.36	30.7	321	10	91	28	0.25	28.3	264	8	78
1st SW Drain-MF Min**	50%	300	60	0.01	0.1	162	3	1	60	0.01	0.1	162	3	1
North Star	50%	300	0	0.02	0.1	6	16	4	1	0.02	0.2	6	11	3
Junction Mine	50%	300	13	0.07	2.2	126	3	14	0	0.00	0.1	3	0	0
Bandora Mine	30%	60	0	0.04	0.1	5	4	10	0	0.02	0.0	2	2	4
Upper Bonner	50%	300	1	0.00	0.0	1	1	1	2	0.01	0.0	2	1	1
Ferrocete Mine	50%	300	2	0.00	0.0	31	5	1	3	0.01	0.0	32	7	1
Paradise **	0%	60	28	0.00	0.1	246	20	2	28	0.00	0.1	246	20	2
Brooklyn Mine*	30%	300	1	0.01	0.2	8	2	2	1	0.01	0.2	8	2	2
Bonner Mine	50%	300	1	0.01	0.0	1	1	1	2	0.00	0.0	2	1	0
Lower Bonner	30%	300	1	0.00	0.0	1	0	0	2	0.00	0.0	2	1	1
Little Dora	50%	300	1	0.33	0.9	5	653	48	0	0.00	0.0	0	2	0
Total Mineral Creek			141	0.86	34.4	913	718	175	125	0.32	29.0	728	57	94
<u>Animas above Eureka</u>														
Vermillion Mine	50%	300	0	0.04	0.2	2	1	9	0	0.01	0.1	1	0	3
Columbus	50%	300	1	0.01	0.3	3	0	9	0	0.02	0.1	1	0	4
Lower Comet	0%	10	2	0.00	0.1	2	2	1	2	0.00	0.0	1	1	1
N side of Calif. Mtn.**	30%	60	4	0.01	0.0	1	5	2	4	0.01	0.0	1	5	2
Sound Democrate	50%	60	0	0.00	0.1	0	4	1	0	0.00	0.0	0	2	0
Mountain Queen	50%	300	0	0.00	0.2	1	0	1	0	0.00	0.1	0	0	0
Silver Wing	30%	0	0	0.00	0.1	0	0	0	0	0.00	0.3	1	1	1
Bagley	30%	300	0	0.01	0.0	0	13	7	0	0.01	0.0	0	6	3
Senator	30%	300	0	0.00	0.0	21	7	0	1	0.00	0.0	23	14	2
Total Animas above Eureka			8	0.08	1.0	30	33	29	8	0.06	0.7	29	29	15
<u>Animas below Eureka</u>														
Royal Tiger	50%	300	5	0.04	0.8	0	3	7	0	0.00	0.1	0	0	0
Pride of the West	30%	60	0	0.01	0.0	0	0	3	0	0.01	0.0	0	0	2
Little Nation	30%	300	0	0.00	0.0	9	2	1	0	0.00	0.0	4	1	0
Total Animas below Eureka			6	0.06	0.8	9	5	10	0	0.02	0.1	4	2	3
GRAND TOTAL			198	1.3	44.5	1,272	825	271	143	0.46	31.0	875	113	124

* No low flow data. Low flow loads are extrapolated from high flow data

** No high flow data. High flow loads are extrapolated from low flow data.

Table 11.2 Metal loads from selected mine waste rock sites in the Upper Animas Basin

Site Name	Acres	% Reduction	Cost \$1000	Load in pounds per year					
				Al	Cd	Cu	Fe	Mn	Zn
<u>Cement Creek</u>									
Galena Queen	1.09	90	300	154	36.8	832	6,895	0.0	6137
Kansas City #2	0.46	40	60	159	7.1	39	3,979	0.0	1172
Hercules	1.26	90	300	163	30.6	168	6,712	0.0	4711
Upper Joe & Johns	0.02	40	300	2	0.1	2	19	0.0	23
Grand Mogul - East	0.53	35	300	47	2.0	29	745	0.0	385
Kansas City #1	0.48	40	60	82	1.2	19	1,618	0.2	282
Black Hawk	0.20	50	60	82	0.5	6	124	0.1	108
Lead Carbonate	0.62	55	300	120	0.8	27	1,228	0.0	179
Henrietta 3	0.86	20	60	217	0.7	107	4,972	0.0	113
Ross Basin	0.15	10	60	9	0.3	18	234	0.0	49
Lark	0.66	90	60	18	0.8	40	886	0.0	168
Pride of the Rockies	0.05	45	60	7	0.1	0	383	0.1	7
Henrietta # 7	1.19	40	300	101	0.8	25	1,685	0.0	159
Mogul	1.16	35	300	51	1.2	32	942	0.0	261
Cement Creek Total	8.72			1,210	83.1	1,343	30,421	0.5	13,754
<u>Mineral Creek</u>									
Brooklyn	0.25	90	300	58	0.8	8	993	117	118
Bullion King:Lower	0.86	90	300	641	6.0	14	9,945	190	629
Upper Browns Trench	0.11	40	10	27	0.1	8	198	3	9
Congress Shaft	0.35	40	60	11	0.2	16	109	11	20
Brooklyn Upper	2.57	20	60	661	3.1	38	9,909	176	163
Upper Browns	0.51	90	60	82	0.3	5	1,610	6	25
Little Dora	1.39	30	300	94	0.4	43	452	471	66
Brooklyn Lower	0.86	20	60	110	0.6	9	672	122	105
Mineral Creek Total	7			1,684	11.5	142	23,888	1,095	1,135
<u>Animas above Eureka</u>									
Ben Butler	0.34	40	300	28	0.8	8	225	1	165
Silver Wing	1.21	50	60	98	1.0	123	393	172	131
Tom Moore	0.19	90	60	15	0.3	1	8	43	73
Eagle	0.07	90	60	1	0.1	1	0	7	18
Lucky Jack	0.70	90	60	16	0.6	3	14	32	95
Animas above Eureka Total	3			157	2.8	136	639	256	482
<u>Animas below Eureka</u>									
Clipper	0.09	90	60	6	0.2	7	80	57	70
Buffalo Boy	0.38	90	60	17	0.8	24	13	73	141
Ben Franklin	0.37	90	60	81	0.4	13	612	99	95
Caledonia	0.57	30	60	23	1.0	15	1	50	255
Sunnyside	2.50	90	1,000	40	2.3	10	0	536	664
Animas below Eureka Total	4			168	4.6	69	706	815	1,224
GRAND TOTAL	22			3,219	102	1,691	55,655	2,167	16,595



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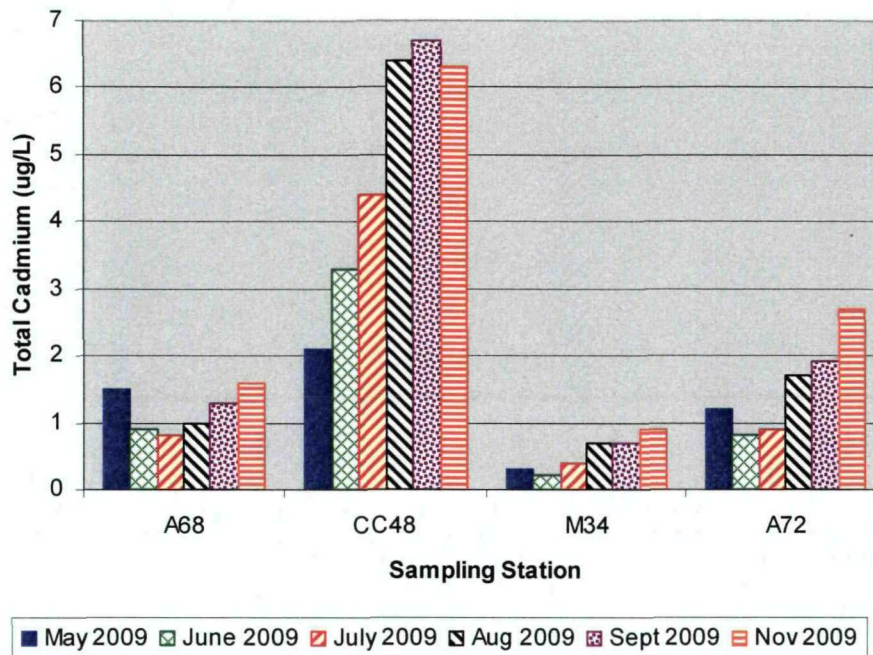
Background

- Since 1994, there have been remediation efforts in Mineral Creek, the Upper Animas, and Cement Creek.\
- BLM has had a large Abandoned Mined Land focus in the entire watershed since the mid 1990s.
- Others, using EPA, state, and mining interests' funds have spent millions in the watershed doing primarily waste site remediation.
- In the Cement Creek drainage, active water treatment began by SMC in 1970s and was updated over the years by Sunnyside. Since 1996, the American Tunnel has had three bulkheads installed, flow has decreased from 1,600 gpm to about 150 gpm. The Red & Bonita Mine, and other upgradient adits' and seeps discharges are now making up the difference in the American Tunnel flow. Gladstone's active water treatment was intermittent from about 2002 – 2005 and stopped in 2005; settling ponds reclaimed in 2006.

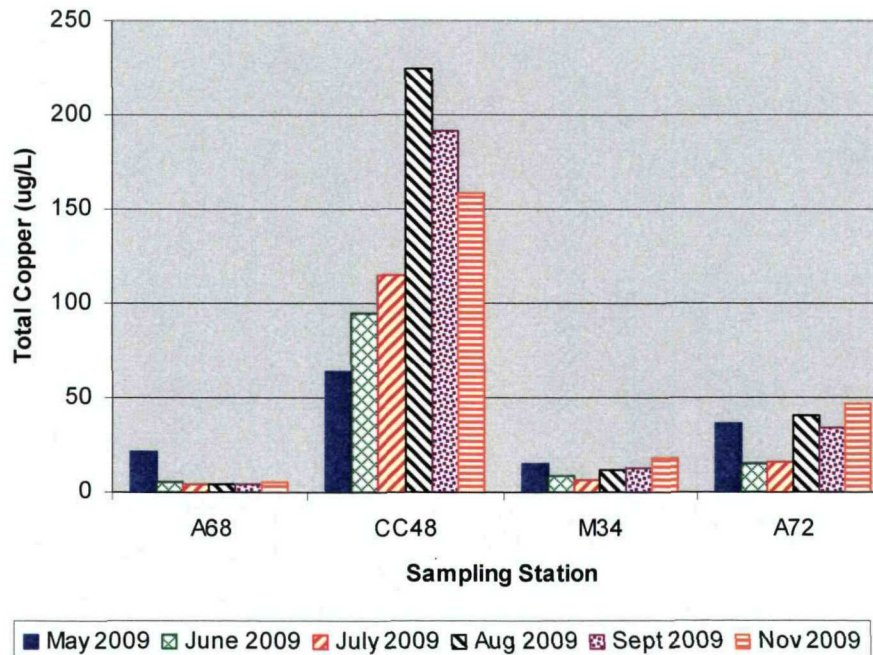
Problem

- Upper Cement Creek still contributes a large negative impact on the TMDL compliance point, known as A72. Since
 - Landowners: BLM/USFS and Private landowners and mining interests
- A72 is about 8 miles downstream of Gladstone. (See table showing relationship of five Upper Cement Creek sources to the 2001 compilation of 34 adits' impacts on loads. Various waste dumps also, but adits contribute about 85% of loads, mine waste about 15%).
- Therefore Cement Creek is a focus area for EPA and BLM.

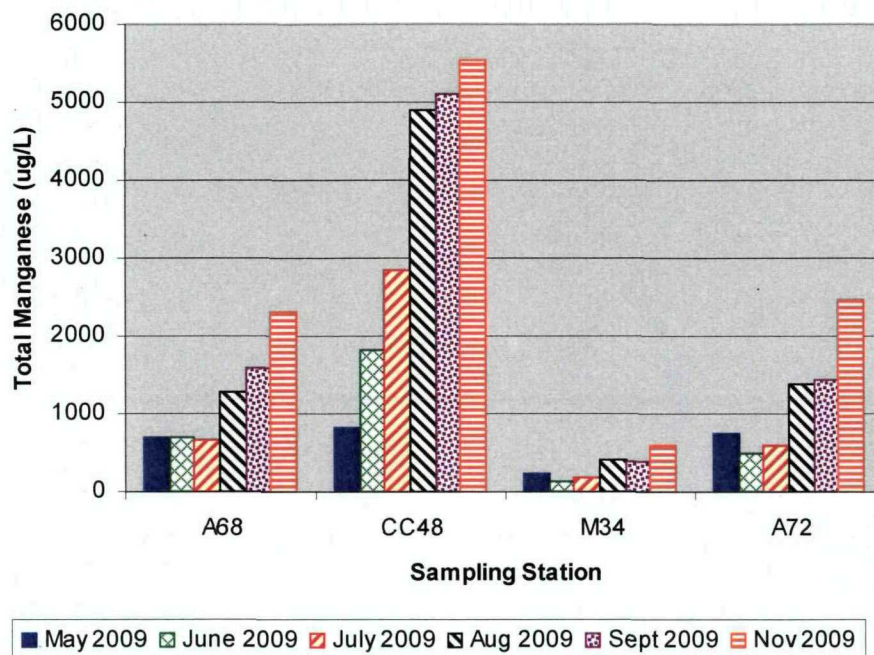
**Animas River - Mainstem and Tributary
2009 Total Cadmium Concentrations**



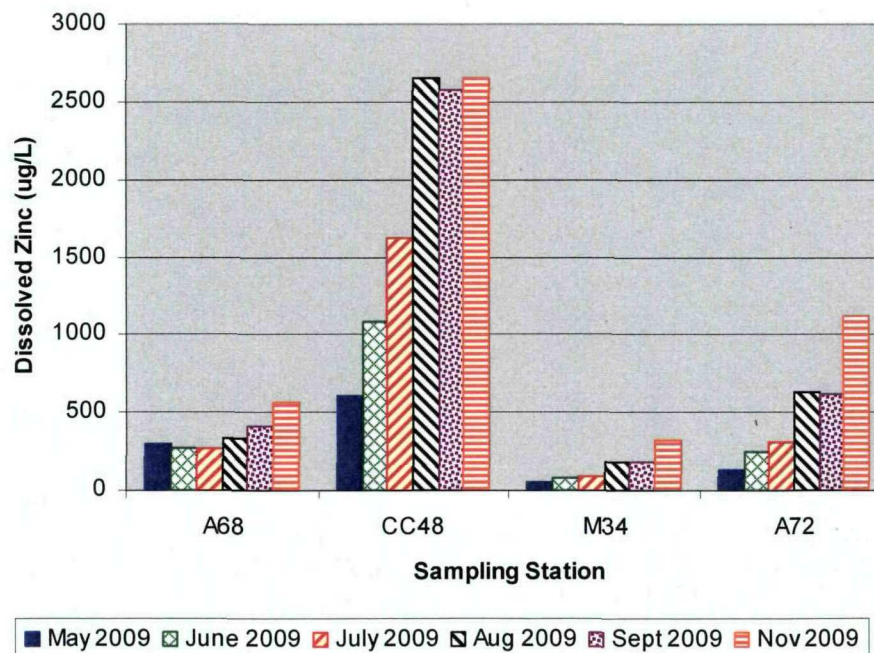
**Animas River - Mainstem and Tributary
2009 Total Copper Concentrations**



**Animas River - Mainstem and Tributary
2009 Total Manganese Concentrations**

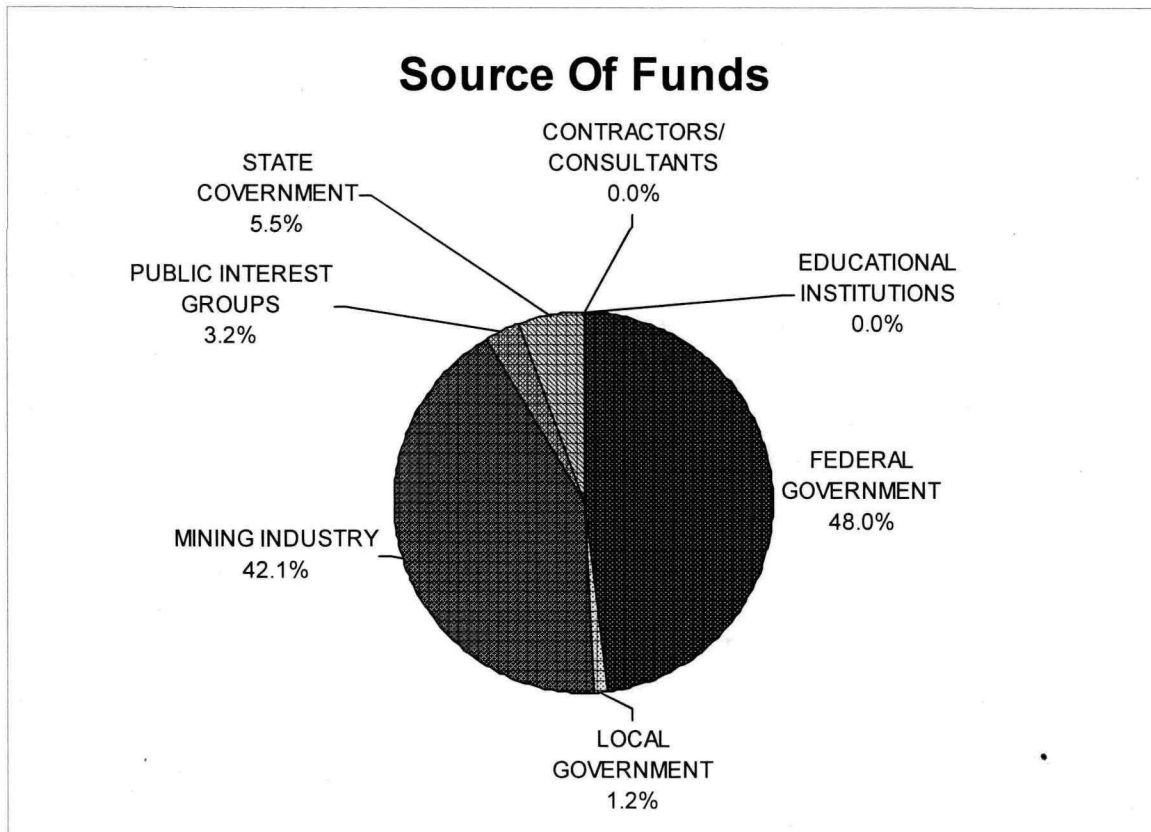


**Animas River - Mainstem and Tributary
2009 Dissolved Zinc Concentrations**



Source Of Funds By Sector

Sector	Amount	Percentage
CONTRACTORS/CONSULTANTS	\$0.00	0.0%
EDUCATIONAL INSTITUTIONS	\$0.00	0.0%
FEDERAL GOVERNMENT	\$16,945,566.00	48.0%
LOCAL GOVERNMENT	\$411,229.00	1.2%
MINING INDUSTRY	\$14,863,507.00	42.1%
PUBLIC INTEREST GROUPS	\$1,119,091.00	3.2%
STATE GOVERNMENT	\$1,931,610.00	5.5%
Total	\$35,271,003.00	



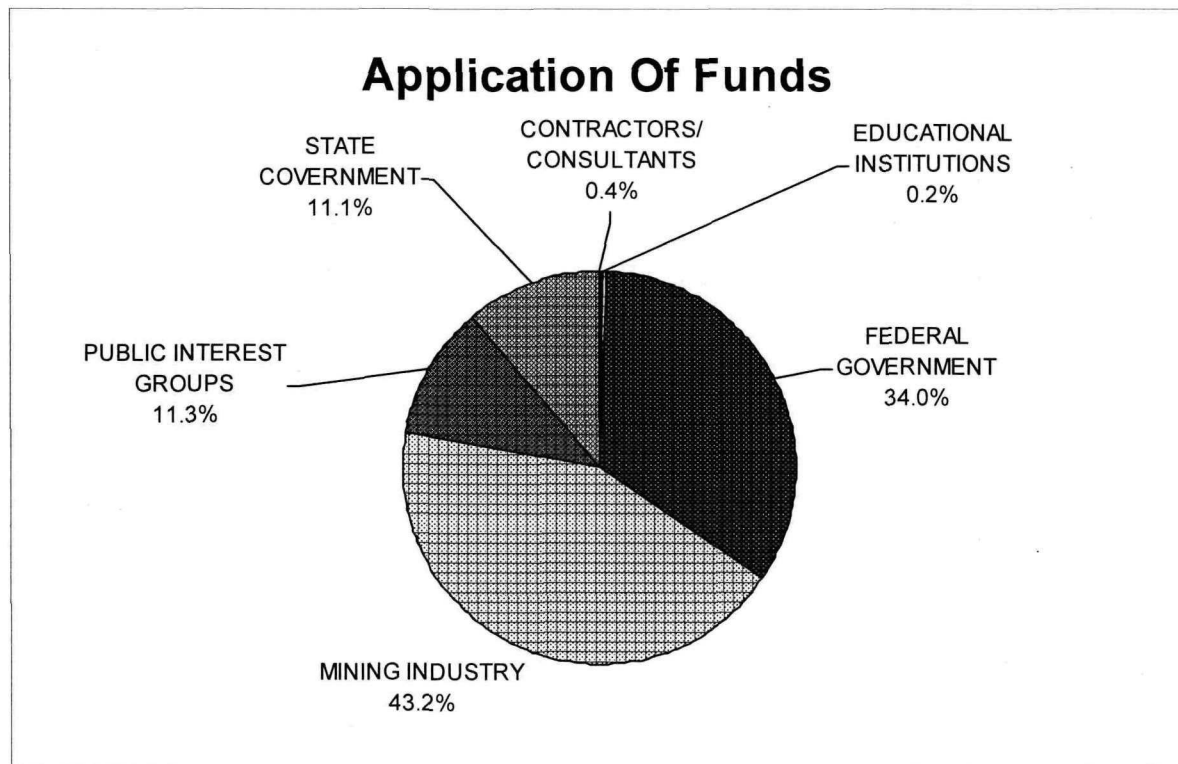
Source Of Funds

Stakeholder	Sector	Amount
ANIMAS RIVER STAKEHOLDER GROUP (ARSG)	PUBLIC	\$1,079,091.00
BUREAU OF LAND MANAGEMENT (BLM)	FED	\$4,506,067.00
BUREAU OF MINES (BOM)	FED	\$5,500.00
BUREAU OF RECLAMATION (BOR)	FED	\$405,466.00
COLORADO CENTER FOR ENVIRONMENTAL MANAGEMENT (CCEM)	CNSLT	\$0.00
COLORADO GEOLOGICAL SURVEY (CGS)	STATE	\$31,784.00
COLORADO HISTORICAL FUND (CHF)	PUBLIC	\$40,000.00
COLORADO SCHOOL OF MINES (CSM)	EDUCAT	\$0.00
COLORADO WATER CONSERVATION BOARD (CWCB)	STATE	\$12,000.00
DENVER & SILVERTON NARROW GAGE RAILROAD (D&S)	MINING	\$14,700.00
DEPARTMENT OF ENERGY (DOE)	FED	\$103,000.00
DEPARTMENT OF LOCAL AFFAIRS (DLA)	STATE	\$599,755.00
DIVISION OF HAZARDOUS MATERIALS & WASTE MANAGEMENT (DHMMW)	STATE	\$56,928.00
DIVISION OF RECLAMATION, MINING & SAFETY	STATE	\$320,382.00
DIVISION OF WILDLIFE (DOW)	STATE	\$910,761.00
DURANGO CITY OF (DUR)	LOCAL	\$15,900.00
ENVIRONMENTAL PROTECTION AGENCY (EPA)	FED	\$2,996,501.00
FRIENDS OF THE ANIMAS (FA)*	PUBLIC	\$0.00
GOLD KING MINES (GKM)	MINING	\$642,046.00
MINE REMEDIAL RECOVERY COMPANY (MRRC)	MINING	\$38,484.00
OFFICE OF SURFACE MINING (OSM)	FED	\$429,343.00
PANENERGY CORP. (PEC)	MINING	\$479,167.00
RIVERWATCH (RW)	EDUCAT	\$0.00
SALEM MINERALS INC. (SMI)	MINING	\$23,802.00
SAN JUAN COUNTY (SJC)	LOCAL	\$29,767.00
SAN JUAN COUNTY HISTORICAL SOCIETY (SJCHS)	PUBLIC	\$0.00
SAN JUAN RESOURCE CONSERVATION & DEVELOPMENT DISTRICT (SJRCDD)	LOCAL	\$9,337.00
SILVER WING COMPANY INC. (SWC)	MINING	\$114,708.00
SILVERTON, TOWN OF (SIL)	LOCAL	\$2,180.00
SOUTHERN UTE INDIAN TRIBE (SUTE)	LOCAL	\$15,900.00
SOUTHWEST WATER CONSERVATION DISTRICT (SWCD)	LOCAL	\$338,145.00
SUNNYSIDE GOLD COMPANY (SGC)	MINING	\$13,536,600.00
TUSCO	MINING	\$14,000.00
US GEOLOGICAL SURVEY (USGS)	FED	\$6,916,805.00
USDA FOREST SERVICE (USFS)	FED	\$1,582,884.00
WATER QUALITY CONTROL DIVISION (WQCD)	STATE	\$0.00
YOUTH & NATURAL RESOURCES (YNR)	EDUCAT	\$0.00
Total		\$35,271,003.00

* Included With ARSG

Application Of Funds By Sector

Sector	Amount	Percentage
CONTRACTORS/CONSULTANTS	\$98,000.00	0.3%
EDUCATIONAL INSTITUTIONS	\$69,929.00	0.2%
FEDERAL GOVERNMENT	\$11,992,586.00	34.0%
MINING INDUSTRY	\$15,232,508.00	43.2%
PUBLIC INTEREST GROUPS	\$3,977,596.00	11.3%
STATE GOVERNMENT	\$3,900,384.00	11.1%
Total	\$35,271,003.00	



Application Of Funds

Stakeholder	Sector	Amount
ANIMAS RIVER STAKEHOLDER GROUP (ARSG)	PUBLIC	\$3,927,596.00
BUREAU OF LAND MANAGEMENT (BLM)	FED	\$2,074,029.00
BUREAU OF MINES (BOM)	FED	\$261,000.00
BUREAU OF RECLAMATION (BOR)	FED	\$297,890.00
COLORADO CENTER FOR ENVIRONMENTAL MANAGEMENT (CCEM)	CNSLT	\$98,000.00
COLORADO GEOLOGICAL SURVEY (CGS)	STATE	\$100,149.00
COLORADO HISTORICAL FUND (CHF)	PUBLIC	\$50,000.00
COLORADO SCHOOL OF MINES (CSM)	EDUCAT	\$69,929.00
DEPARTMENT OF ENERGY (DOE)	FED	\$19,900.00
DIVISION OF HAZARDOUS MATERIALS & WASTE MANAGEMENT (DHMMW)	STATE	\$56,928.00
DIVISION OF RECLAMATION, MINING & SAFETY	STATE	\$2,896,035.00
DIVISION OF WILDLIFE (DOW)	STATE	\$847,272.00
ENVIRONMENTAL PROTECTION AGENCY (EPA)	FED	\$66,431.00
GOLD KING MINES (GKM)	MINING	\$623,296.00
MINE REMEDIAL RECOVERY COMPANY (MRRC)	MINING	\$96,211.00
PANENERGY CORP. (PEC)	MINING	\$523,899.00
SALEM MINERALS INC. (SMI)	MINING	\$40,552.00
SILVER WING COMPANY INC. (SWC)	MINING	\$402,950.00
SUNNYSIDE GOLD COMPANY (SGC)	MINING	\$13,545,600.00
US GEOLOGICAL SURVEY (USGS)	FED	\$7,952,084.00
USDA FOREST SERVICE (USFS)	FED	\$1,321,252.00
Total		\$35,271,003.00

* Included With ARSG

Annual Cost Summary

Year	Watershed	Reclamation	Historical	Total
1994	\$862,444.00	\$2,829,500.00		\$3,691,944.00
1995	\$333,963.00	\$1,029,211.00		\$1,363,174.00
1996	\$591,176.00	\$3,458,267.00		\$4,049,443.00
1997	\$1,189,567.00	\$2,111,741.00		\$3,301,308.00
1998	\$1,997,675.00	\$1,725,979.00	\$59,947.00	\$3,783,601.00
1999	\$1,433,332.00	\$1,591,673.00	\$101,415.00	\$3,126,420.00
2000	\$1,870,898.00	\$1,119,543.00	\$50,000.00	\$3,040,441.00
2001	\$1,044,386.00	\$1,695,823.00		\$2,740,209.00
2002	\$428,487.00	\$1,231,087.00		\$1,659,574.00
2003	\$760,230.00	\$2,979,391.00		\$3,739,621.00
2004	\$301,846.00	\$1,735,317.00		\$2,037,163.00
2005	\$484,227.00	\$2,030,878.00		\$2,515,105.00
2006	\$50,000.00	\$173,000.00		\$223,000.00
Total	\$11,348,231.00	\$23,711,410.00	\$211,362.00	\$35,271,003.00

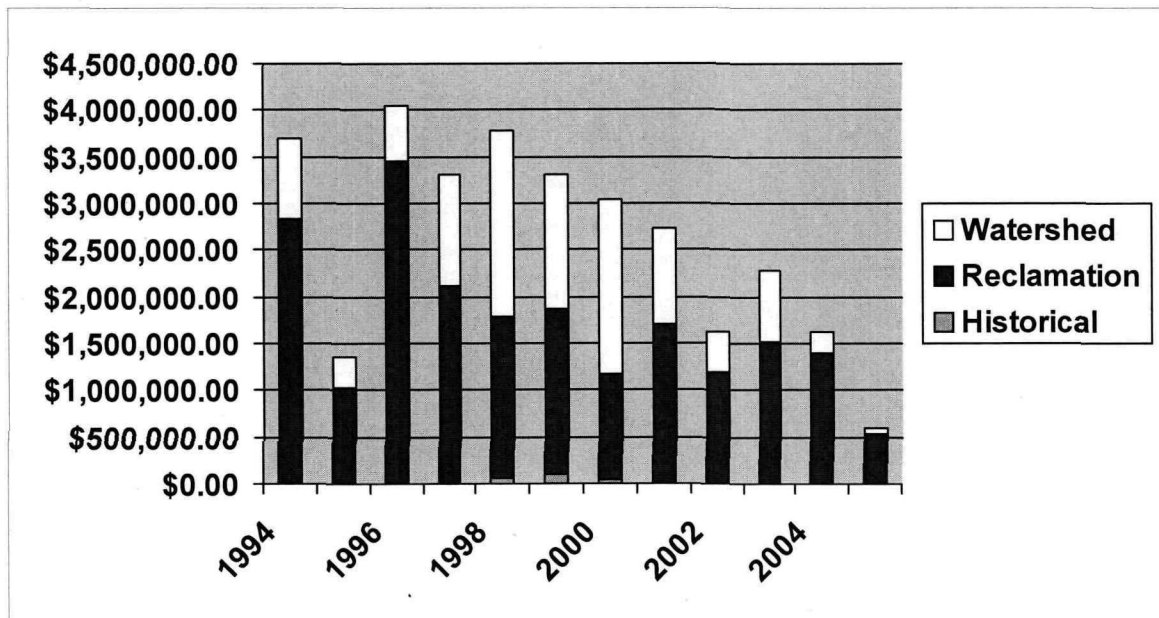


Table 3.1
Summary of Reclamation Projects (Updated 8/28/07)

(1) Project Sponsor	(2) Project Site Name	(3) Location	(4) Type of Remediation	(5) Project Timeframe	(6) Funding (incl. in-kind match)	(7) Improvements (actual or anticipated)
Sunnyside Gold Corp.	Lead Carbonate Millsite	Gladstone on bank of S. Fork of Cement Creek	Removal of 27,000 yards of tailings from streambank	Completed 1991	SGC: \$163,000	Reduce loading of metals and erosion transport of tailings
Sunnyside Gold Corp.	Mayflower Mill – Tailings Ponds #1, #2 and #3	Mayflower Mill complex near Boulder Creek and Animas River	Re-contour inactive tailings ponds and cap. 625,000 yards of tailings and overburden moved.	Completed 1991-1992	SGC: \$1,755,000	Mined land reclamation –reduce loading of metals and erosion transport of tailings
Sunnyside Gold Corp.	Lake Emma Sunnyside Basin	Sunnyside Basin headwaters of Eureka Creek	Fill mine subsidence, remove 240,000 yards mine waste and re-contour disturbances.	Completed 1991-1993	SGC: \$911,000	Mined land reclamation and reduce loading of metals
Sunnyside Gold Corp.	American Tunnel waste dump	Gladstone on bank of S. Fork of Cement Creek	Remove 90,000 yards of waste dump and underlying historic tailings	Completed 1995	SGC: \$766,500	Mined land reclamation and reduce loading of metals and erosion transport of tailings
Sunnyside Gold Corp.	Eureka Townsite	On banks and In floodplain of Animas River	Remove 112,000 yards of tailings	Completed 1996	SGC: \$843,000	Reduce loading of metals and erosion transport of tailings
Sunnyside Gold Corp.	Gladstone	Cement Creek at Gladstone	Divert and treat Cement Creek to mitigate any short term impacts of reclamation projects	8/96-5/99, 11/99-12/99	SGC: \$901,000	Reduce loading to Animas River to offset any short term impacts of reclamation of other sites.
Sunnyside Gold Corp.	Boulder Creek Tailings	Flood plain of Boulder Cr. and the Animas River	Remove 5700 yards of tailings	Completed 1997	SGC: \$32,500	Reduce loading of metals and erosion transport of tailings
Sunnyside Gold Corp.	Ransom adit	Eureka townsite above old mill foundation	Bulkhead seal to stop deep mine drainage and reclaim portal	Completed 1997	SGC: \$85,400	Restore hydrologic regime and reduce rate of ore oxidation by placing mine workings under water to reduce metal loading.
Sunnyside Gold Corp.	Gold Prince mine waste and tailings	Headwaters of Placer Gulch	Bulkhead seals to stop deep mine drainage. Consolidate mine waste and tailings (moved 6000 yards) and construct upland diversions	Completed 1996-1997	SGC: \$151,000	Reduce exposure to water to reduce metal loading

Sunnyside Gold Corp.	Longfellow-Koehler	Headwaters of Mineral Creek near top of Red Mountain Pass	Remove Koehler dump (32,100 yards), consolidate Junction Tunnel dump and Longfellow dump and cap. Capture adit drainages. Construct diversions. Feasibility study of wetland treatment of Koehler drainage.	Completed 1996-1997	SGC: \$580,000	Reduce metal loading and erosion transport of mine waste
Sunnyside Gold Corp.	Pride of the West tailings	Howardsville near confluence of Cunningham Creek with Animas River	Remove 84,000 yards of tailings	Completed 1997	SGC: \$490,500 TUSCO: \$14,000	Reduce metal loading and transport of tailings by erosion
Sunnyside Gold Corp.	Sunnyside Mine	Sunnyside Mine Lake Emma Area	Inject 652 tons of hydrated lime into the Sunnyside Mine pool to provide increased alkalinity and improve initial mine pool conditions	Completed 1996-1997	SGC: \$313,000	Improve initial conditions as water table is restored through bulkheading to stop mine drainage
Sunnyside Gold Corp.	Mayflower Upland Hydrological Control	Mayflower Mill and Tailings Pond #1 area near Silverton	Capture and divert three upland drainages that were going sub-surface up-gradient of the mill and TP #1 facilities	Completed 1998-1999	SGC: \$186,000	Minimize potential for contact of runoff with tailings and reduce potential for metal loading
Sunnyside Gold Corp.	TP #4 drainage modification	Drainage ditch between Hwy. 110 and TP #4 near Silverton and Animas R.	Install lined diversion ditch to capture surface runoff and prevent infiltration through tailings material	Completed 1999	SGC: \$72,000	Minimize potential for contact of runoff with tailings and reduce potential for metal loading
Sunnyside Gold Corp.	TP #4 upland groundwater diversion	Up-gradient from Tailings Pond #4 near Silverton	Capture groundwater and divert around tailings impoundment	Completed 1993-1995, 1999	SGC: \$409,000	Minimize potential for contact of groundwater with tailings and reduce potential for metal loading
Sunnyside Gold Corp.	Sunnyside Mine hydraulic seal project	Sunnyside Mine	Bulkhead placement in Sunnyside Mine to restore hydrologic regime to approximate pre-mining and eliminate drainage from adits (6 bulkheads)	Completed 1992-1996	SGC: \$2,346,000	Place mine workings under water to reduce oxidation, restore groundwater movement around mine workings and eliminate need for perpetual water treatment
Sunnyside Gold Corp.	Power Plant Flats	Power Plant Flats, Animas River floodplain	Removal of mill tailings from floodplain	Completed 2003	SGC: \$?	Excavate buried tailings and dispose into Mayflower Tailings Pond #4
Sunnyside Gold Corp.	Mogul Mine Bulkhead	Mogul Mine, Upper Cement Crk.	Stop discharge of AMD from Mogul Mine	Summer, 2003	SGC: \$?	Reduce metal loading to Upper Cement Crk

Sunnyside Gold Corp.	Kohler Mine Bulkhead	Kohler Mine, Headwaters of Mineral Crk	Stop discharge of AMD from Kohler mine	Summer, 2003	SGC: \$	Reduce metal loading to Mineral Crk. Headwaters
Sunnyside Gold Corp.	Reactive Wall	Animas floodplain below MF. Tailings #4	Treat contaminated groundwater before entering Animas River	Fall, 2003	SGC: \$	Reduce metal loading to Animas River
Gold King Mines Corp	Gold King Mine	Gladstone, N. Fork of Cement Creek	Hydrologic controls for workings and mine waste	1998	Gold King: \$117,300	Reduce metal loading to North Fork of Cement Creek
Gold King Mines Corp	Gold King Mine discharge	Gold King discharge treatment	Pipe mine discharge to Gladstone to actively treat	2002	Gold King: \$?	Reduce metal loading to Upper Cement Crk.
Silver Wing Mining Co	Silver Wing	Animas river, about 1.5 mile above Eureka	Collect AMD, hydrological controls	1995	Silver Wing \$7,000	Remove AMD from dump, reduce metals loading
Office of Surface Mining	Galena Queen	Prospect Gulch	Waste consolidation & hydrological controls	1998	Office of Surface Mining: \$10,000	Reduce surface water leaching of toxic metals
Silver Wing Mining Co	Silver Wing	Animas River, about 1.5 miles above Eureka	Anoxic Drain, settling pond, bioreactor	1999-2000	NPS 319 Funds: \$216,000. St. Severance tax: \$144,000	Reduce metal loading to the Animas River.
San Juan RC & D (ARSG)	Carbon Lakes Mine Dump	Headwaters of Mineral Creek East of Red Mountain Pass	Removal of 1,900 cubic yards of waste rock from stream channel	Phase 1 – completed 1999	NPS 319 Funds: \$72,000 ARSG match: \$62,800	Reduce loading of metals especially Cadmium, Copper, Iron, Lead, Manganese, and Zinc
San Juan RC & D (ARSG)	Carbon Lakes Mine Waste Phase II Part 1	Headwaters of Mineral Creek East of Red Mountain Pass	Complete removal of waste rock from stream channel	2001 season	NPS 319 Funds: \$38,000 ARSG Match: \$51,000	Reduce loading of metals to Animas River, restore stream channel, revegetate
San Juan RC & D (ARSG)	Carbon Lakes Phase II, Part 1	Headwaters of Mineral Creek East of Red Mountain Pass	Removal and disposal of 3000 tons of <u>Congress Mine Dump</u> wastes	2001 season	NPS 319 Funds: \$38,500 ARSG Match: \$42,500	Reduce loading of metals to Animas River by beginning the removal of mine wastes.
San Juan RC & D (ARSG)	Carbon Lakes Phase II, Part 2	San Antonio & Kohler Tunnel infiltration control	Infiltration Control: Purchased Carbon Lakes Trans-basin diversion rights; abandoned ditch	2001 season	NPS 319 Funds: \$50,000 ARSG Match: \$33,333	Reduce water infiltration to the San Antonio and Kohler Mines; reduce AMD

San Juan RC & D (ARSG)	Red Mtn. Project	Carbon Lakes Ditch Restoration	Ditch, Wetland and Stream Restoration	2003	SWWCD: \$5,000; USFS: \$12,400	Return Mineral Crk headwaters to natural hydrology; erosion controls; restoration of transbasin diversion ditch; wetland restoration.
San Juan RC & D (ARSG)	Red Mtn. Project	Congress Mine, Mineral Crk. headwaters	Complete removal of Congress mine wastes	2003	NPS 319: \$174,000; July, 2003; St. Min. Severance Tax: \$?	Reduce metal loading to Animas River by removal of mine wastes and benefaction.
San Juan RC & D (ARSG)	Red Mtn. Project	San Antonio Mine Waste Control project	Hydrological controls, remove wastes from stream, consolidation, neutralization, revegetation	2004	Ca. \$80,000; 40% match from Silver Wing Co. disposal fees.	Reduce metal loading and acidity to Mineral Creek; stabilize site, restore streambed
San Juan RC & D (ARSG)	Handies Peak Project	Lucky Jack Mine wastes and drainage	Hydrological controls, remove wastes from fen, consolidation, neutralization, revegetation; adit and shaft closures	2004	Ca. \$75,000; match from Co. Mineral Severance	Reduce metal loading and acidity to Upper Animas River; uncover fen and restore
San Juan RC & D (ARSG)	Handies Peak Project	Upper Lucky Jack Mine wastes and drainage	Consolidation, neutralization, & revegetation of waste dump; clean streambed of wastes	2005	Ca. \$13,095; match from Co. Mineral Severance	Reduce metal loading and acidity to Upper Animas River from leaching mine wastes partially residing in stream
San Juan RC & D (ARSG)	Infiltration Control Project	Pride of the West Mine Open Stopes	Combined safety and infiltration closure of 2 large open stopes & 1 raise.	2005	Ca 700,000; Min. Severance; NPS =\$125K; Match=\$84K	Reduced surface water infiltration into mine to reduce metal loading at mine discharge.
San Juan RC & D (ARSG)	Priority Waste Site	Kansas City #1, 2, and 3 mines	Safety closure, mine waste consolidation and burial; revegetation; run-on/off controls.	2006	Ca 175,000; Mineral Severance, NPS, DMG safety pro	Reduced surface water leaching of mine wastes.
San Juan RC & D (ARSG)	Red Mtn. Project	Upper Browns trench and mine	mine waste consolidation and burial; revegetation; run-on/off controls.	2006	\$62,000 NPS \$41,333 match	. Reduced surface water leaching of mine wastes
Anglo Saxon, Inc	Anglo Saxon/Porcupine Mines	Cement Creek	Determine water pressure behind 2 closed portals	2009	\$14,000 NPS \$10,000 Anglo Saxon, Inc.	Characterization for evaluation of bulkheads in mines
Mining Remedial Recovery	Sunbank Group	Placer Gulch	Anoxic drain, settling pond, waste consolidation, bulkhead	1995	NPS 319 Funds: \$58,000 MRRC: 38,500	Raise pH from draining adit, reduce metal loading from adits and mine waste

Salem Minerals	Mammoth Tunnel	North Fork of Cement Creek	Settling ponds for mine drainage	1999	NPS 319 Funds: \$10,050. Salem Minerals: \$6,700	Focused on reductions of iron to Cement Creek
Office of Surface Mining	Galena Queen	Prospect Gulch	Waste consolidation & hydrological controls	1998	Office of Surface Mining: \$10,000	Reduce surface water leaching of toxic metals
San Juan RC&D (ARSG)	Galena Queen and Hercules	Prospect Gulch	Waste Removal, hydrol. controls, amendments, revegetation.	2001	NPS 319 Funds: \$94,800 Mineral Sev: \$90,000	Elimination of surface water leaching of toxic metals. Post remediation monitoring begins in 2002.
U.S. BLM	Joe & John Tunnel	Prospect Gulch	Mine drainage collection and diversion	1998-1999	BLM: \$36,000	Collect AMD for later treatment project development
U.S. BLM	Lark Mine	Prospect Gulch	AMD collection, hydrological controls	1999	BLM: \$17,800	Collect AMD for possible treatment, remove surface water from site
U.S. BLM	Forest Queen	Animas near Eureka	AMD collection and passive wetland treatment	1998-1999	BLM: \$290,000	Reduce metal loading to Animas River
U.S. BLM	Mayday Mine	Cement Creek	Hydrological controls, cap top of mine waste pile	1998-1999	BLM: \$87,000	Reduce surface water leaching of toxic metals
U.S. BLM	Lackawanna Tailings	Animas near Silverton	Removal of tailings from flood plain to Mayday dump for consolidation and capping.	2000	BLM: \$300,000	Reduce metal loading to Animas River
U.S. BLM	Elk Tunnel	Cement Crk	Passive treatment of mine discharge	2003	BLM: \$110,000	Reduce Fe loading to Cement Crk
U.S. BLM & Duke Energy	Henrietta Mine 6 & 7 levels	Cement Crk	Mine waste consolidation, neutralization, clay cap, top soil, revegetation	2004	Duke Energy, \$500,000; BLM \$unknown	Reduce metals and acidity in Prospect and Cement Creeks
U.S. BLM	Upper Joe & John & Lark mines	Cement Crk	Consolidation of mine wastes from 2 mines sites into one lined repository	2006-7	BLM: >\$600,000	Reduce Fe, Zn, Cu, Cd, Pb loading to Cement Crk
U.S. F.S.	Bonner Mine	North Fork of Mineral Creek	Waste removal and consolidation; capture mine drainage and reroute	2000	F. S.: \$63,384	Reduce metal loading of N. Fork Mineral Creek from mine waste and draining adit
U.S. F.S.	Brooklyn Mine	Browns Gulch – tributary of Mineral Creek	Mine waste removal and disposal in pit w/impervious cap.	2004	F. S.: Unknown	Reduce metal and acidity from leaching into Mineral Creek.

Total For Each Entity (through 2002 only)

PRIMARY SPONSOR	TYPE OF PROJECT	Primary Fund Source/Amt.	Match Source and Amount	Total Construction Cost
SJRC&D (ARSG)	NPS 319 – Mine wastes	NPS 319 / \$329,635	SGC, St. Severance Tax/ \$219,757	\$549,392
SJRC&E (ARSG)	NPS 319 – Mine Wastes	NPS 319/ \$362,740	St. Severance Tax,, Silver Wing Co. / \$472,500	\$835,240
Forest Service	AML Mine Wastes & mine drainage control	U. S. Forest Service / \$63,384	none	\$63,384
BLM	Mine Wastes	BLM / \$440,800	None	\$440,800
BLM	Mine drainage treatment	BLM / \$290,000	None	\$290,000
Office of Surface Mining	Mine Waste treatment	OSM / \$10,000	none	\$10,000
Other Private Companies	Mine drainage treatment	Owners / \$124,301	None	\$124,301
Other Private Companies	Mine Waste treatment	NPS / \$58,000	\$38,500	\$96,500
Other Private Companies	Mine Waste treatment	NPS / \$226,050	\$150,700	\$376,750
TOTAL FROM ALL ENTITIES (except SGC)	Mine waste and drainage treatments combined	\$1,904,910	\$881,457	\$2,786,367
Sunnyside Gold Corp (SGC)	Mine Waste Treatments	\$10,219,600	none	\$10,219,000
TOTAL WITH <u>ALL</u> ENTITIES	Mine waste and drainage treatments combined	\$12, 124, 510	\$881,457	\$13,005,367

*Send Nieman
the ASG & EPA
Water data
→ USGS
do we need contractor
support - ? y
Call May re:
Matt Janowick's
mag*

Potential Solutions

- Water Treatment – BLM willing to build a WTP, but can't do O&M
- Plug adits
- Combine WTP and plugging ←
- Remove American Tunnel bulkheads (three) and treat water indefinitely from one location.

my report's options

Possible EPA Approaches

- Coordinated removal with EPA and BLM/USFS + Enforcement actions on viable PRPs (including leveraging landowner contributions where applicable)
- Fund lead removal actions + BLM/USFS
- Enforcement of PRP-lead actions (Sunnyside + others)
- Use of settlement funds from SMC
- NPL - ask State again about listing - 4/11

*purchase PRP for
O&M
put into enforceable
agreements*

Local Concerns

- Against listing
- Want mining in their future

Watershed Challenges

- Lack of water treatment in Gladstone is impacting the TMDL compliance point below Silverton at A72.
- Water quality flow and loads have been changing since the last bulkhead went into the American Tunnel (2002).
- The worst sources are the Gold King Mine 7 level; Red & Bonita Mine, American Tunnel, and the Mogul Mine (Grand Mogul to lesser degree).

Ongoing Issues/Considerations

- BLM may not support listing
- CDPHE and past CD with Sunnyside
- State has lead on ASARCO \$4 Million trust from Silver Lake settlement

Next Steps

- PRP search and viability determined
- Technical info/data: *for plugging to reduce water → drainable plugs*
- Agency(ies) discussions regarding preferences and implications
- Communications with local government

Talk to State

SUMMARY BRIEF FOR LUY MARTINE